

12.—The genus *Ctenotus* (Lacertilia, Scincidae) in the South-West and Eucla Divisions of Western Australia

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Manuscript received 20 February 1973; accepted 20 March 1973.

Abstract

The following 17 taxa are defined and keyed out: *pantherinus pantherinus* (Peters), *pantherinus ocellifer* (Boulenger), *lesueurii* (Duméril & Bibron), *fallens* sp. nov., *severus* Storr, *alleni* sp. nov., *mimetes* Storr, *uber uber* Storr, *atlas* Storr, *impar* Storr, *lancelini* Ford, *labillardieri* (Duméril & Bibron), *gemmula* sp. nov., *delli* sp. nov., *catenifer* sp. nov., *schomburgkii* (Peters), and *brooksi euclae* Storr. Lectotypes are designated for *Lygosoma lesueurii* Duméril & Bibron and *Tiliqua australis* Gray.

Introduction

This is the fourth in a series of regional surveys of the genus *Ctenotus*. Previous papers covered the Eastern Division of Western Australia (Storr 1969), the Northern Territory (Storr 1970), and South Australia (Storr 1971).

This paper is based on material in the Western Australian Museum (registered numbers without prefix) and a few specimens kindly loaned by the National Museum of Victoria (NMV), the South Australian Museum (SAM), Museum of Comparative Zoology (MCZ), Muséum National d'Histoire Naturelle (Paris), and Zoological Museum of Humboldt University (Berlin). The number of specimens examined in each taxon were *p. pantherinus* (20), *p. ocellifer* (1), *lesueurii* (49), *fallens* (162), *severus* (10), *alleni* (2), *mimetes* (7), *u. uber* (6), *atlas* (2), *impar* (45), *lancelini* (5), *labillardieri* (368), *gemmula* (25), *delli* (11), *catenifer* (14), *schomburgkii* (25), and *brooksi euclae* (30).

In the descriptions of species quantitative characters are usually expressed as ranges with means in brackets. The term "palpebrals" here applies to the scales along the free edge of the upper eyelid. The term "calli" refers to thickenings of the subdigital lamellae too broad to be called keels. "Presuboculars" are the scales aligned with and immediately posterior to the loreals.

Key to species and subspecies

1. Dorsal and lateral pattern lacking ocelli 2
- Dorsal and lateral pattern consisting wholly or mainly of black-and-white ocelli—*pantherinus* group 6
2. Dorsal and lateral pattern usually including longitudinal series of spots, blotches, dots and dashes, as well as stripes and lines 3
- Dorsal and lateral pattern consisting solely of alternating longitudinal black and white stripes—*taeniolatus* group 11

3. Subdigital lamellae smooth, callose or obtusely keeled; snout-vent length up to 105 mm 4
- Subdigital lamellae sharply keeled; snout-vent length up to 52 mm—*schomburgkii* group 16
4. Three supraoculars normally in contact with frontal; presuboculars 2 5
- Usually two supraoculars in contact with frontal; presuboculars 3 *labillardieri* group 12
5. Subdigital lamellae smooth or broadly callose; SVL up to 105 mm—*lesueurii* group 7
- Subdigital lamellae obtusely keeled or narrowly callose; SVL up to 77 mm—*leonhardii* group 10
6. A black vertebral stripe (sometimes incomplete or discontinuous) No vertebral stripe *p. pantherinus*
p. ocellifer
7. A well-defined black vertebral stripe, narrowly edged with white Vertebral stripe absent or reduced to a black line 8
8. Nuchals normally 4 or 5; usually a white line on nape between paravertebral and dorsolateral white lines, extending forward along edge of frontal and backward for varying extent; a series of oblique white bars behind arm; midbody scale rows seldom more than 26; lamellae under fourth toe seldom less than 24 *lesueurii*
- Nuchals normally 2 or 3; no white line between paravertebral and dorsolateral lines; no oblique white bars behind arm; midbody scale rows seldom less than 28; lamellae under fourth toe seldom more than 24 *fallens*
9. White dorsolateral line margined above by broad blackish laterodorsal stripe and separated below from dark upper lateral zone by narrow hiatus of pale ground colour; lamellae under fourth toe less than 25; nuchals 2 or 3 *severus*
- White dorsolateral line margined above by narrow black laterodorsal stripe and in contact below with black of upper lateral zone; lamellae under fourth toe more than 25; nuchals 4 *alleni*
10. Midlateral white stripe well defined; dark laterodorsal stripe not enclosing a series of pale spots *mimetes*
- Midlateral stripe not or barely discernible; laterodorsal stripe enclosing a series of pale spots *u. uber*
11. White stripes totalling 11 (including a vertebral stripe) or 12 (without a vertebral stripe); nasals and prefrontals separated; labials usually 7 *impar*
- White stripes totalling 8 or 10 (no vertebral stripe); nasals and prefrontals seldom separated; labials usually 8 *atlas*
12. White dorsolateral line continuous; abdomen yellow; subdigital calli wide 13
- White dorsolateral line broken into a series of short dashes; abdomen white; subdigital calli narrow 14

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13. Hindleg reddish *labillardieri*
 Hindleg yellowish *lancelini*
14. Hindleg yellowish brown, boldly
 marked with black and white;
 labials 8 *gemmula*
 Hindleg olive-grey, dotted with
 blackish brown; labials seldom
 more than 7 15
15. Back dark brown, unpatterned be-
 tween narrow black laterodorsal
 stripes *delli*
 Back olive grey, strongly patterned
 (broad blackish laterodorsal stripe
 often bearing a series of white dots;
 usually some trace of dark vertebral
 line) *catenifer*
16. Dorsal ground colour dark (olive
 grey or olive brown); presuboculars
 2; plantars opposite fourth toe not
 differentiated *schomburgkii*
 Dorsal ground colour very pale
 (pinkish in life, white in alcohol);
 one presubocular; plantars oppo-
 site fourth toe enlarged and keeled *brooksi euclae*

Ctenotus pantherinus pantherinus

Lygosoma (Hinulia) pantherinum Peters, 1866, Mber. Akad. Wiss. Berlin 1866: 89. Swan River, Australia.

Diagnosis. A large *Ctenotus* whose dorsal and lateral pattern consists mainly of black-and-white ocelli; subdigital lamellae sharply keeled; nasal grooved.

Distribution. Northern interior of South-West Division, from the lower Murchison, south to Mt Lesueur, New Norcia and Quairading. Extralimital in far southwest of Eastern Division (16 mi. S of Karalee).

Description. Snout-vent length (mm): 36-90 (67.9). Length of appendages (% SVL): tail 152-186 (173), foreleg 22-31 (26.5), hindleg 39-45 (41.1).

Nasals in contact. Prefrontals usually in contact, occasionally separated very narrowly. Supraoculars 4, first three in contact with frontal. Supraciliaries usually 7, occasionally 8, mean 7.2. Palpebrals 9-13 (11.4). Second loreal 0.8-1.4 (1.02) times as wide as high. Upper labials usually 8, occasionally 9, mean 8.1. Ear lobules 4-8 (5.7), obtuse in juveniles, subacute in adults. Nuchals usually 2 or 3, occasionally 1 or 4, mean 2.7. Midbody scale rows usually 32 or 34, seldom 30 or 36, mean 33.4. Lamellae under fourth toe 22-25 (23.6).

Dorsal and lateral ground colour coppery brown, occasionally washed with olive-green. Black vertebral stripe usually extending from nape to base of tail, but sometimes disappearing at midback or becoming broken posteriorly. Usually 5, sometimes 4, longitudinal series of ocelli on each side of body, *viz.* a paravertebral, a dorsolateral and two or three lateral, each ocellus consisting of a short white bar margined on each side by a short black bar. White bars of dorsolateral and midlateral ocelli in some specimens almost continuous enough to form stripes.

Material. South-West Division: Janja Thicket, 16 mi. ENE of Kalbarri (37616); Galena (29627); Binnu (25599); 14 mi. NE of Morawa (17299); Mt Lesueur (11162-3); 7 mi. NE of Miling (17300-5); 7 mi. N of New Norcia (17306); Dangin (17307); near Quairading (2482); Wamenusking (8555); Bruce Rock (21371). Also the holotype (Berlin 5379).

Ctenotus pantherinus ocellifer

Lygosoma ocelliferum [Boulenger], 1896, Ann. Mag. Nat. Hist. (6) 18: 342. Broome, W.A. (K. Dahl).

Diagnosis. Differing from *C. p. pantherinus* mainly in lacking black vertebral stripe.

Distribution. Arid mallee-spinifex zone of Eucla Division. Extralimital in Kimberley, North-West and Eastern Divisions of Western Australia and in Northern Territory and South Australia.

Description. See Storr (1969: 99; 1970: 98).

Material. 8 mi. E of Fraser Range (30756).

Ctenotus lesueurii

Lygosoma lesueurii Duméril & Bibron, 1839, Erpétologie générale 5: 733. Nouvelle Hollande (Péron & Lesueur). *Tiliqua australis* Gray, 1839, Ann. Nat. Hist. 2: 291. Australia. [= *Lygosoma australe* (Gray) of Peters, not *Lygosoma australis* Gray.]

Diagnosis. A large member of the *lesueurii* group with a pale-edged vertebral stripe and a dark-edged dorsolateral line. Distinguishable from *C. fallens* by its brighter and more complex pattern (including a pale dorsal line on nape between paravertebral and dorsolateral lines, extending forward along edge of frontal and for varying distances backward; and pale dark-edged oblique ventrolateral bars behind arm), more numerous nuchals (rarely less than 4), fewer midbody scale rows (rarely more than 26), and more numerous lamellae under fourth toe (seldom less than 24).

Distribution. West coast and coastal plains south to Augusta, thence east to the Albany district.

Description. Snout-vent length (mm): 43-101 (79.8). Length of appendages (% SVL): tail 200-253 (230), foreleg 24-30 (26.0), hindleg 41-53 (46.7).

Nasals separated. Prefrontals in contact (occasionally separated very narrowly or by an azygous scale). Supraoculars 4, first 3 in contact with frontal, second very large. Supraciliaries 6-9 (rarely other than 7; mean 7.0). Palpebrals 10-14 (11.9). Second loreal 1.0-2.2 (1.47) times as wide as high. Upper labials 8 (occasionally 9; mean 8.1). Ear lobules 3-7 (mean 4.7); obtuse in juveniles; acute, subacute or truncate in adults; third mostly largest. Nuchals usually 4, occasionally 5, rarely 3, mean 4.2. Midbody scale rows 24-28 (25.1). Lamellae under fourth toe 23-28 (25.9), smooth or broadly callose.

Dorsal ground colour greyish brown in adults, coppery brown in juveniles. Blackish-brown vertebral stripe from nape to base of tail, much narrower than a paravertebral scale, with a narrow white margin, which in turn is narrowly margined with black. White dorsolateral line from rear of orbit to tail, on which it is suffused with brown; margined above with black (laterodorsal stripe). A dorsal line on nape between black paravertebral line and black laterodorsal stripe, extending forward along outer edges of frontoparietal and frontal. Upper lateral zone blackish brown with a series of white spots or dashes. White midlateral stripe from ear nearly to end of tail, anteriorly breaking up and tending to join with white ventrolateral spots which behind arm are

modified into short oblique bars. A white line curving under orbit. Upper labials edged with brown.

Remarks. Of the three extant syntypes of *Lygosoma lesueurii* in the Paris Museum, I choose as lectotype no. 2982, collected by Péron & Lesueur (presumably on the west coast of Western Australia in 1801); this is the specimen whose measurements are given in the original description.

Mr. A. F. Stimson of the British Museum tells me (*in litt.*, 7 January 1972) that none of their specimens can be certainly identified as type of *Tiliqua australis* Gray. In order to stabilise that name, I designate the lectotype of *Lygosoma lesueurii* Duméril & Bibron as neotype of *Tiliqua australis* Gray.

Material. South-West Division: Meanarra Hill, 4 mi. E of Kalbarri (33529); Wittecarra Gully, 5 mi. SE of Kalbarri (33882); 11 mi. SSE of Kalbarri (33784); 1 mi. SSW of Kalbarri (33668-9, 33712); between Cockleshell Gully and Jurien Bay (12695); Favourite Island (17202); near mouth of Hill River (13440, 17205); Green Islets (17208-9); Muchea (462); Scarborough (28925); Mt Yokine (19112, 21714, 21885); Bedford (9121); North Perth (4840); Leederville (8885); Kings Park (17239); Nedlands (6672); South Perth (29652-3, 29772-5, 30252-4, 33384-5, 39085, 39983, 40842-5); Riverton (28330); Gosnells (10978); Mandurah (40847); Augusta (30235); Chorkerup (4538).

Ctenotus fallens sp. nov.

Holotype. R 33780 in Western Australian Museum, collected by Lawrence A. Smith on 6 February 1969 at 11 mi. SSE of Kalbarri, Western Australia, in 27° 52' S, 114° 12' E.

Diagnosis. Generally similar to *C. lesueurii*, differing in duller and simpler pattern (*e.g.*, no dorsal pale line between paravertebral and dorsolateral pale lines, and no oblique ventrolateral barring behind arm), fewer nuchals (seldom more than 3), more numerous midbody scale rows (usually more than 26), and fewer lamellae under fourth toe (seldom more than 24).

Distribution. Northern half of South-West Division, south to Pinjarra and inland to the Loop (lower Murchison), Balla Tank, Koolanooka Hills and Corrigin; also on Houtman Abrolhos (West Wallabi, Middle, Rat, Helsinki, and Hut Islands), Jurien Bay Islands (Green, Boullanger and Favourite), Wedge Island, Lancelin Island and Rottneest Island. Extralimital in North-West Division.

Description. Snout-vent length (mm): 35-95 (68.7). Length of appendages (% SVL): tail 175-261 (218); foreleg 20-32 (25.9); hindleg 35-54 (43.8).

Nasals usually separated. Prefrontals in contact (very narrowly separated in one specimen). Supraoculars 4, first 3 (2 in 2 specimens) in contact with frontal. Supraciliaries 6-8 (mostly 7, rarely 6, mean 7.2). Palpebrals 9-14 (11.3). Second loreal 1.1-2.3 (1.55) times as wide as high. Upper labials 7-9 (mostly 8, rarely 7, mean 8.1). Ear lobules 2-6 (3.8), subacute, acute or truncate in adults, obtuse in juveniles, second or third usually largest. Nuchals 1-5 (mostly 2,

rarely more than 3, mean 2.3). Midbody scale rows 25-33 (28.1). Lamellae under fourth toe 17-26 (22.0), smooth or broadly callose.

Dorsal ground colour dark or pale greyish brown in adults, blackish in juveniles. Blackish brown vertebral stripe from nape to base of tail, narrower than a paravertebral scale, with a narrow white margin, which in turn may be edged with black. White dorsolateral line from above temples to tail, on which it is suffused with brown, broadly margined above with black. Upper lateral zone dark brown with a series of white blotches, spots or dashes. White mid-lateral stripe from behind eye to tail. Lower lateral zone pale grey or pale brown, irregularly spotted with white. Indistinct white line curving under eye.

Material. South-West Division: Gee Gie Out-camp, 21 mi. NNW of Murchison House (34039); Kalbarri (29924); The Loop, 22 mi. NE of Kalbarri (33868); Meanarra Hill, 4 mi. E of Kalbarri (33538); 19 mi. E of Kalbarri (33585); Red Bluff (33875, 37643); Lockwood Spring and Hawks Head Lookout, 20 mi. SE of Kalbarri (33847, 33872, 37565-7); 11 mi. SSE of Kalbarri (33776-83); 11 mi. SSW of Kalbarri (33666-7, 33711); Balla Tank, 23 mi. E of Ajana (40850); Koolanooka Hills (29580); Lake Arrowsmith (40849); 40 mi. S of Dongara (19762); Stockyard Gully (26743-5); Green Head (30289); 5 mi. NE of Mt Peron (25284); Mt Lesueur (11161); 5 mi. N of Jurien Bay (17200); 5 mi. NE of Jurien Bay (30478); 5 mi. E of Jurien Bay (30503); Frenchman Bay (17206-7); mainland opposite Green Islets (17210); 10 mi. NE of Lancelin (22282); Lancelin (17214); Ledge Point (33428-31); 7 mi. N of New Norcia (17216-20); Beermullah (4807); between Mougumber and Gingin (30233); Gingin (40036); Culham (17221, 22450-4); Julimar Forest, 15 mi. NW of Toodyay (36332); 3 mi. SE of Bullsbrook (36329); Sorrento (41641-2); Balcatta (14860); North Perth (4838-9); City Beach (17238, 37742; NMV D9798); Cottesloe (7869); Wembley (13111); Gooseberry Hill (24689); 6 mi. E of Kalamunda (34082); Mundaring Weir (14856-7, 16532, 19656, 20594, 21228, 26448, 26475, 40019); 10 mi. SE of Sawyers Valley (22672); Darlington (5987-9, 21263-5); Bickley (13543); Roleystone (17240-5); Karragullen (17246-7); Gosnells (29328); Kelmscott (41177); York (7320, 12663-5); Corrigin (12434); Darling Scarp, between Pinjarra and Dwellingup (25095); West Wallabi Island, Houtman Abrolhos (17253-62, 19602-3); Middle Island, Houtman Abrolhos (27185); Hut Island, Houtman Abrolhos (37518, 41550); Rat Island, Houtman Abrolhos (41535, 41556); Helsinki Island, Houtman Abrolhos (41546); Green Island, 12 mi. N of Jurien Bay (17199, 17201); Favourite Island, Jurien Bay (17203); Boullanger Island, Jurien Bay (17204); Wedge Island (17211-3); Lancelin Island (17215); Rottneest Island (3266-8, 17129, 17222-36; NMV R974-81).

Ctenotus severus

Ctenotus severus Storr, 1969: 101. Galena, W.A. (G. M. Storr).

Diagnosis. A medium-sized member of the *lesueurii* group, generally similar to *C. fallens* and differing mainly in colour pattern—black

vertebral stripe absent or reduced to a line on foreback or neck and not white-edged; black laterodorsal stripe broad and sharp-edged; dark upper lateral zone separated from white dorsolateral line by a hiatus of pale ground colour.

Distribution. Far northern interior of South-West Division, south to Galena and Gullewa. Extralimital in North-West Division (southern interior) and Eastern Division (southwest).

Description. Snout-vent length (mm): 54-91 (68.4). Length of appendages (% SVL): tail 213-224 (218); foreleg 20-27 (23.8); hindleg 36-46 (42.7).

Nasals separated. Prefrontals in contact (narrowly separated in one specimen). Supraoculars 4, first 3 in contact with frontal. Supraciliaries 7 or 8 (7.3). Palpebrals 9-11 (10.4). Second loreal 1.2-1.6 (1.34) times as wide as high. Ear lobules 4-6 (4.8). Nuchals 2 or 3 (2.7). Midbody scale rows 27-32 (29.7). Lamellae under fourth toe 19-23 (21.7).

For further details of coloration, see original description.

Material. South-West Division: Galena (17195-6, 19994-6, 25680-3); Gullewa (40848).

Ctenotus alleni sp. nov.

Holotype. R 33602 in Western Australian Museum, collected by Nicholas T. Allen on 17 January 1969 at 11 miles north of Galena, Western Australia, in 27° 41' S, 114° 39' E.

Diagnosis. A member of the *lesueurii* group with reduced dorsal pattern, distinguishable from *severus* by its more numerous subdigital lamellae and nuchals, narrower black laterodorsal stripe, and contact between white dorsolateral line and black of upper lateral zone. Superficially similar to *mimetes* but readily distinguishable by wide subdigital calli and by black upper lateral zone enclosing small white spots rather than large rufous rectangular blotches.

Distribution. Far northern interior of South-West Division.

Description (based on holotype and paratype). Snout-vent length (mm): 87, 78. Length of appendages (% SVL): tail 258, 264; foreleg 25, 24; hindleg 48, 48.

Nasals separated. Prefrontals forming median suture. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 7. Palpebrals 12-13. Second loreal 1.3-1.9 times as wide as high. Upper labials 8. Ear lobules 4-6. Nuchals 4. Midbody scale rows 26-28. Lamellae under fourth toe 28-33, each with a moderately wide callus.

Dorsal ground colour olive, darkest on head, palest on tail. Vertebral stripe reduced to a black line on nape. Narrow, clearcut, black laterodorsal stripe from brow to base of tail, about half a scale wide. White dorsolateral line from orbit to base of tail, on which it gradually becomes suffused with ground colour. Black upper lateral zone with one or two series of small white spots or short dashes. White midlateral stripe extending back nearly to end of tail, but barely extending forward to arm. Lower lateral zone blackish brown with one or two irregular series of short dashes.

Paratype. South-West Division: 20 mi. NE of Yuna (26499).

Ctenotus mimetes

Ctenotus mimetes Storr, 1969: 103. 12 miles east of Paynes Find, W.A. (D. A. Richards).

Diagnosis. A member of the *leonhardii* group with long tail and legs, no vertebral stripe, well-developed white midlateral stripe, black laterodorsal stripe narrow and not enclosing spots, and upper lateral zone consisting of alternating rectangular blotches of black and rufous.

Distribution. Northern interior of South-West Division, south and west to Ajana, Carnamah, and Merredin. Extralimital in North-West and Eastern Divisions of Western Australia.

Description. Snout-vent length (mm): 33-77 (63.3). Length of appendages (% SVL): tail 212-246 (228); foreleg 22-30 (25.2); hindleg 45-57 (51.3).

Nasals separated. Prefrontals forming median suture. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 7. Palpebrals 10-14 (12.2). Second loreal 1.0-1.3 (1.23) times as wide as high. Upper labials 8. Ear lobules 3-5 (4.0). Nuchals 3 or 4 (3.2). Midbody scale rows 26-28 (27.3). Lamellae under fourth toe 23-28 (26.2), each compressed and bearing a dark obtuse keel or narrow callus.

For coloration, see original description.

Remarks. A specimen (26499) from the Yuna district was wrongly listed by Storr (1969: 104) under *C. mimetes*; it is actually a specimen of *C. alleni*.

Material. South-West Division: 2 mi. W of Ajana (30321); Yuna (8303, 9027); Carnamah (407); Merredin (1265-6).

Ctenotus uber uber

Ctenotus uber Storr, 1969: 102. 22 miles southeast of Yalgoo, W.A. (P. J. Fuller).

Diagnosis. A member of the *leonhardii* group, distinguishable from *mimetes* by presence of pale spots in dark laterodorsal stripe and absence of pale midlateral stripe.

Distribution. Arid northeast of Eucla Division (Nullarbor Plain). Extralimital in North-West and Eastern Divisions of Western Australia.

Description. Snout-vent length (mm): 44-61 (54.3). Length of appendages (% SVL): tail 157-172 (163); foreleg 22-27 (24.8); hindleg 45-53 (47.0).

Nasals normally separated (forming a median suture in one specimen). Prefrontals separated or in contact. Supraoculars 4, first 3 in contact with frontal. Supraciliaries 6 or 7. Palpebrals 10-13 (10.7). Second loreal 1.0-1.4 (1.34) times as wide as high. Upper labials 8. Ear lobules 3-5 (3.6). Nuchals 3-5 (4.0). Midbody scale rows 30-32 (30.5). Lamellae under fourth toe 21-24 (21.8), each with an obtuse keel.

Dorsal ground colour brown, darker and more olive on head, more coppery on tail and hindlegs. Vertebral stripe variably developed (at best a dark line from nape to base of tail; sometimes absent). Dark brown laterodorsal stripe enclosing an indistinct series of pale brown spots. Brownish-white dorsolateral line

sometimes broken into a series of spots. Upper lateral zone dark brown with 3 or 4 longitudinal series of pale brown dots. Lower lateral zone pale brown, spotted or variegated with brownish white.

Material. Eucla Division: Seemore Downs (17284-5); 57 mi. NNE of Rawlinna (41592); Forrest (17286); 15 mi. S of Forrest (41594); 24 mi. S of Forrest (41593).

Ctenotus atlas

Ctenotus atlas Storr, 1969: 105. 17 miles south of Atley, W.A. (E. & H. Pianka).

Diagnosis. A member of the *taeniolatus* group with 8 or 10 pale stripes. Further distinguishable from *impar* by lack of pale vertebral stripe, nasals and prefrontals usually in contact, and upper labials usually 8.

Distribution. Arid mallee-spinifex zone of Eucla Division. Extralimital in North-West and Eastern Divisions of Western Australia and in the interior of South Australia and of New South Wales.

Description. For further details of coloration and scutellation, see original description.

Material. Eucla Division: 11 mi. E of Fraser Range (30765-6).

Ctenotus impar

Ctenotus impar Storr, 1969: 105. Tambellup, W.A. (F. R. Bradshaw).

Diagnosis. A member of the *taeniolatus* group with 11 (regionally 12) pale lines and stripes, and nasals and prefrontals separated.

Distribution. Southern half of South-West Division, north to the Gingin district, but absent from far southwest (*i.e.* south of Busselton and west of the Fitzgerald). Extralimital in far southwest of Eastern Division.

Description. Snout-vent length (mm): 30-66 (51.8). Length of appendages (% SVL): tail 153-200 (176); foreleg 21-31 (25.7); hindleg 37-50 (43.6).

Nasals and prefrontals separated. Supraoculars 4, first 3 (rarely 2) in contact with frontal. Supraciliaries 5-8 (mostly 7, mean 6.9). Palpebrals 8-13 (10.4). Second loreal 0.9-1.5 (1.19) times as wide as high. Upper labials 7 (occasionally 6 or 8). Ear lobules 2-5 (3.7). Nuchals 2-4 (3.1). Midbody scale rows 25-30 (27.7). Lamellae under fourth toe 18-24 (21.7), each with a dark obtuse keel.

For coloration, see original description.

Geographic variation. Over most of its range *impar* has eleven pale stripes including a broad whitish vertebral stripe. In the northwestern part of its range, *i.e.* from the Gingin district south to Pinjarra, the vertebral stripe is divided by a fine dark line, giving a total of 12 pale stripes.

Material (additional to that listed in Storr 1969). South-West Division: Wanneroo (31450); Armadale (36676); Yunderup (37748-9); 17 and 18 mi. E of Pingrup (39853-7, 39874-6, 39931-2); Lake Magenta Reserve (39939-42); middle and lower Fitzgerald River (36960, 39004); 10 mi. N of Hopetoun (36248, 36287-9).

Ctenotus lanceolini

Ctenotus labillardieri lanceolini Ford, 1969: 69. Lancelin Island, W.A. (J. Ford).

Diagnosis. A large pale member of the *labillardieri* group with yellow legs streaked with blackish brown.

Distribution. Only known from Lancelin Island, off west coast.

Description. Snout-vent length (mm): 68-80 (75.7). Length of appendages (% SVL): tail 189-194 (192), foreleg 20-23 (20.8), hindleg 32-38 (33.4).

Nasals separated (usually narrowly). Prefrontals narrowly separated. Supraoculars 4, first 2 (3 in one specimen) in contact with frontal. Supraciliaries 7 or 8 (7.4). Palpebrals 11-13 (11.4). Second loreal 1.4-1.8 (1.62) times as wide as high. Upper labials 8. Ear lobules 3 or 4 (3.4), subacute or obtuse, second the largest. Nuchals 3 or 4 (3.4). Midbody scale rows 24. Lamellae under fourth toe 22-24 (23.0), each bearing a wide callus.

Dorsally pale brown, irregularly marked with dark brown (markings tending to orientate longitudinally). Poorly defined blackish brown laterodorsal stripe from temples to base of tail, enclosing an irregular series of pale spots. White dorsolateral line from orbit to base of tail. Blackish upper lateral zone enclosing an irregular series of whitish spots and short dashes. White midlateral stripe from ear aperture to base of tail. Dark brown lower lateral zone variably marked with white, including in one specimen a ventrolateral stripe.

Remarks. Lancelin Island is so small and close to the mainland that I find it hard to believe with Ford (1969: 74) that *lanceolini* is only an insular representative of *labillardieri*. I think it more likely that *lanceolini* is a northern representative of *labillardieri*, possibly surviving only on Lancelin Island.

Material. South-West Division: Lancelin Island (18871-5).

Ctenotus labillardieri

Lygosoma labillardieri Duméril & Bibron 1839: 73. New Holland.

Hinulia greyii Gray 1845: 76. Swan River.

Diagnosis. A member of the *labillardieri* group with reddish legs heavily marked with black. Further distinguishable from *gemmula*, *delli* and *catenifer* by the white dorsolateral line continuous (*i.e.* not broken into a series of short dashes).

Distribution. Humid coasts and near-coastal ranges of South-West and Eucla Divisions, north to the Swan River, east to the Thomas River, and inland to Mt Helena, Boddington, Rocky Gully and the Stirling Range; also on Eclipse and Bald Islands and the Archipelago of the Recherche.

Description. Snout-vent length (mm): 25-76 (55.6). Length of appendages (% SVL): tail 142-213 (184); foreleg 20-31 (25.0); hindleg 31-51 (39.4).

Nasals separated (very rarely in short contact). Prefrontals separated (rarely in short contact). Supraoculars 4, first 2 (occasionally

3) in contact with frontal. Supraciliaries 6-9 (7.0). Palpebrals 7-12 (9.6). Second loreal 1.0-2.3 (1.54) times as wide as high. Upper labials 7 or 8 (7.4). Ear lobules 2-6 (3.8), obtuse or subacute. Nuchals 3 or 4 (occasionally 2 or 5, very rarely 6, mean 3.5). Midbody scale rows 24-31 (27.4). Lamellae under fourth toe 20-30 (24.5), each with a dark wide callus.

Coloration in northern Darling Range.—Dorsum brown or olive, without pattern except for narrow black laterodorsal stripe from brow to base of tail (on which it becomes increasingly broken). White dorsolateral line from brow to tail. Black upper lateral zone usually immaculate, extending as a stripe forward through orbit nearly to tip of snout and backward nearly to end of tail. White midlateral stripe from upper lip to distal quarter of tail. Lower lateral zone blackish, enclosing a white ventrolateral stripe. Legs reddish brown, heavily blotched or streaked with black. Abdomen yellow.

Coloration on Bald Island.—Dorsal ground colour olive. Black ragged-edged vertebral stripe usually present. Black laterodorsal stripe very wide, ragged edged, and enclosing a series of small white spots. White dorsolateral line not so straight as in northern specimens. Black upper lateral zone with 1-3 series of white dots. White midlateral stripe wavy, sometimes broken. Lower lateral zone blackish, irregularly spotted or variegated with white.

Geographic variation. In most populations the coloration lies between the extremes described above. In the northern Darling Range the pattern is clear-cut and spotting is rare. Going south, the pattern gradually becomes ragged (especially in adults), black pigment increasingly invades the dorsum, the black stripes become dotted with white, and the white stripes become wavy or disjointed.

For full discussion of variation, see Ford (1969).

Material. South-West Division: Herne Hill (4908); Mt Helena (1978-9, 25583); Stoneville (27857-8); Greenmount (NMV D7615); Darlington (3340-1, 5985-6, 21262); Glen Forrest (627); Mundaring (8850, 14858, 21229, 26447); Mundaring Weir (26476-7, 30678); 4-7 mi. E of Kalamunda (19492-4, 26816, 34337-8, 37475); Gooseberry Hill (4676); Kewdale (31946); Churchmans Brook (17981-2); Gosnells (4965); Bartons Mill (10262-4); Karragullen and 5 mi. SE (17987-8, 19118); Roleystone (17990); Araluen (31548); Canning Dam (12912); Wungong Brook (17985-6); Byford and 3 and 5 mi. E (17984, 19247, 19803); 4 mi. N of Jarrahdale (17983); Gleneagle (26291, 32470); Serpentine (17977-80); 6 mi. E of Keysbrook (17992-5); Banksiadale (6768, 34252-5); Dwellingup (39958-61, 39979, 40123); Boddington (10708-10); Lake Clifton (17966-8); Collie and vicinity (17969, 19244-6, 22831); Margaret River (17953-5); Mammoth Cave (66); Boranup (13417, 19833-4, 27850, 32465); Karridale (13446); Deepdene (12426, 12776, 36343); 5 mi. N of Augusta (37801-2, 37807); Augusta (30232); Cape Leeuwin (259, 263, 12783, 17956-65); Calgardup (7732); 7 mi. S of Nannup (27847);

10 mi. E of Nannup (21894); Carey Brook, Donnelly River (27848-9, 41039-49); 6 mi. NW of Manjimup (39725-9); Manjimup (5578-9, 5582, 8184, 19039-40, 37819); 7 mi. S of Manjimup (17950-1); Pemberton (5580-1, 37968-9); Northcliffe (19489-91); Mt Chudalup (17970-3); Broke Inlet (26433); Nornalup (11039); Kent River (260-1); Rocky Gully and 6 mi. W (17962, 41050-5); Pardelup (18004); Chorkerup (4514); Denmark, including Rudgyard, Valley of Giants, and Monkey Rock (19853-4, 22460-72, 24692-9, 24942-7, 31188-90, 31984, 37961, 37963-4); Albany (10946); King George Sound (NMV D2735-8); Eclipse Island (6803, 11278); Gidley Brook (27846); Lower Kalgan (19117); Two Peoples Bay (36354-7, 36383-4, 37834-5); Mt Many Peaks (17872-6); Waychinicup River (27845, 29699, 41148-55); Cheyne Beach (17926-47, 19976, 29700, 36010-3, 36015, 36018-9); Bald Island (17903-25, 19972-4, 40815-6); Porongorup Range (21805-8); Mt Toolbrunup (21809-15); Bluff Knoll (17974-5); Mt Bland (36882-5); Boondadup River (36918-9, 37187-94, 37199); east of Mt Barren (17976); Kundip (11005). Eucla Division: Oldfield River (30144); Dalyup River (17949); Dempster Head, Esperance (14948); 6 mi. NE of Esperance (SAM 5952); 5 mi. N of Cape Le Grand (30802-3); Mt Le Grand (22529); mouth of Thomas River (36251-68); Figure of Eight Island (10119; NMV D8247); Boxer Island (NMV D9799, D9805); Thomas Island (10234); Mondrain Island (17901-2; NMV D8240); Middle Island (8684).

Ctenotus gemmula sp. nov.

Holotype. R 29640 in Western Australian Museum, collected by Magnus Peterson and Bryan J. Harty on 8 October 1967 at South Perth, Western Australia, in 32° 00' S, 115° 49' E.

Diagnosis. A small member of the *labillardieri* group, distinguishable from *labillardieri* by its broken white dorsolateral stripe and narrower subdigital calli, and from *delli* by its 8 (rather than 7) upper labials and legs boldly blotched (not obscurely dotted) with black.

Distribution. Southern half of South-West and Eucla Divisions, north to the Swan River and east to Israelite Bay.

Description. Snout-vent length (mm): 31-58 (50.0). Length of appendages (% SVL): tail 163-203 (188); foreleg 21-29 (23.8); hindleg 34-47 (39.8).

Nasals separated (rarely touching). Prefrontals usually narrowly separated, occasionally in short contact. Supraoculars 4, first 2 in contact with frontal. Supraciliaries 6-8 (6.9). Palpebrals 8-12 (10.4). Second loreal 1.1-1.7 (1.34) times as wide as high. Upper labials 8. Ear lobules 2-5 (3.4), acute or subacute in adults, second usually largest. Nuchals 2-4 (3.3). Midbody scale rows 24-28 (24.7). Lamellae under fourth toe 23-27 (24.9), each with a dark obtuse keel.

Dorsally olive grey, unmarked except for narrow black laterodorsal line from brow to base of tail. A dorsolateral series of short white dashes from brow to base of tail. Black upper lateral

zone with or without a series of white spots, extending forward as a broken stripe through orbit nearly to tip of snout and backward on to proximal quarter of tail. White midlateral stripe wavy or broken into series of short dashes. Narrow dark grey lower lateral zone variably marked with white. Legs yellowish brown boldly marked with black and white.

Paratypes. South-West Division: South Perth (29595-6, 29639-42, 29651, 29741, 29776-7, 30260, 34396, 37734, 37744-6, 40698, 40748, 40846, 41145, 41567); Rocky Gully (41056); 4 mi. W of Lake Cairlocup (41170); 11 mi. E of Greenshields Soak, Lake Magenta Reserve (39941). Eucla Division: 5 mi. W of Israelite Bay (31102).

Ctenotus delli sp. nov.

Holotype. R 37478 in Western Australian Museum, collected by John Dell on 29 April 1970 at 6 miles east of Kalamunda, Western Australia, in 31° 57' S, 116° 08' E.

Diagnosis. A small member of the *labillardieri* group with legs dark olive, finely peppered with black and white. Further distinguishable from *labillardieri* by broken white dorsolateral line, and from *gemmula* by upper labials usually 7 (rather than 8).

Distribution. The northern Darling Range, from the Helena River to Mt Cooke.

Description. Snout-vent length (mm): 34-63 (45.0). Length of appendages (% SVL): tail 156-179 (168); foreleg 24-32 (27.7); hindleg 35-45 (41.1).

Nasals usually separated, occasionally in short contact. Prefrontals separated, usually widely. Supraoculars 4, first 2 in contact with frontal. Supraciliaries usually 7, occasionally 8. Palpebrals 8-12 (9.7). Second loreal 1.3-1.8 (1.52) times as wide as high. Upper labials usually 7, occasionally 8. Ear lobules 3-5 (4.0), obtuse, very small (especially compared to width of aperture). Nuchals 3 or 4 (3.3). Midbody scale rows 28-36 (29.9). Lamellae under fourth toe 23-29 (25.7), each with a dark, narrow callus.

Dorsally dark olive brown, unmarked except for narrow indistinct black laterodorsal stripe from brow nearly to tail. White dorsolateral line from brow to tail (on which it becomes suffused with brown), broken, except anteriorly, into a series of short dashes. Black upper lateral zone from orbit nearly to end of tail, bearing one or more series of white dots. White midlateral stripe broken into series of short dashes, extending forward to below eye and indistinctly backward to about base of tail. Lower lateral zone dark grey flecked with white.

Paratypes. South-West Division: 2 mi. SE of Darlington (22582); 4 mi. E of Kalamunda (39982); 6 mi. E of Kalamunda (19120, 34349, 36453, 37476-7, 37985); Karragullen (17989); Mt Cooke (40755).

Ctenotus catenifer sp. nov.

Holotype. R 21819 in Western Australian Museum, collected by Julian R. Ford on 5 November 1963 on hill slopes above Cheyne Beach, Western Australia, in 34° 52' S, 118° 34' E.

Diagnosis. A small member of the *labillardieri* group with legs olive brown longitudinally marked with series of black dots. Further distinguishable from *labillardieri* by its broken white dorsolateral line and from *delli* and *gemmula* by its heavily patterned back and lack of white midlateral stripe.

Distribution. South coast of South-West Division, from West Cape Howe to Cheyne Beach, inland to Chorkerup; with a slightly different population 125 miles to northeast (near Ravenshorpe).

Description. Snout-vent length (mm): 33-58 (48.7). Length of appendages (% SVL): tail 168-191 (176); foreleg 21-29 (25.3); hindleg 33-44 (38.1).

Nasals separated. Prefrontals separated, usually widely. Supraoculars 4, first 2 in contact with frontal. Supraciliaries 6-8 (7.2). Palpebrals 8-10 (8.8). Second loreal 1.1-1.4 (1.21) times as wide as high. Upper labials usually 7, occasionally 8. Ear lobules 3-6 (4.2), acute or subacute in adults, obtuse in juveniles, first or second usually largest. Nuchals 3 or 4 (3.5). Midbody scale rows 24-30 (26.7). Lamellae under fourth toe 21-25 (22.7), each with a dark obtuse keel or narrow callus.

Dorsal ground colour olive grey flecked with black. An irregular black vertebral stripe occasionally present. Broad black laterodorsal stripe from brow to tail, ragged edged and bearing a series of pale dots. White dorsolateral line from brow to tail, more or less broken into a series of short dashes. Black upper lateral zone bearing a series of white dots. Dark grey lower lateral zone irregularly flecked with whitish.

Remarks. For photograph and description of peculiar specimen from near Ravenshorpe, see Ford (1969).

Paratypes. South-West Division: West Cape Howe (21823); Chorkerup (4251); Two Peoples Bay (36375, 36386, 40989-90); Waychincup River (17877); Cheyne Beach (17935, 17942, 36013-5, 36318); Phillips River, 11 mi. W of Ravenshorpe (18005).

Ctenotus schomburgkii

Lygosoma schomburgkii Peters, 1863, Mber. Akad. Wiss. Berlin 1863: 231. Buchsfield, S.A. (R. Schomburgk).

Diagnosis. A member of the *schomburgkii* group, distinguishable from *C. brooksi euclae* by its dark dorsal colouration and two presuboculars.

Distribution. Interior of South-West and Eucla Divisions. Extralimital in North-West and Eastern Divisions of Western Australia and in south of Northern Territory, northern South Australia, and western New South Wales.

Description. Snout-vent length (mm): 30-49 (40.7). Length of appendages (% SVL): tail 163-214 (188); foreleg 24-32 (27.0); hindleg 43-61 (51.2).

Nasals and prefrontals separated. Supraoculars 4 (rarely 5), with 3 (rarely 2) in contact with frontal. Supraciliaries mostly 7, occasionally 6, rarely 8. Palpebrals 7-10 (9.0). Second loreal 1.2-2.1 (1.68) times as wide as high. Upper labials 7 (occasionally 6 or 8). Ear

lobules 2-5 (3.2), short and obtuse, the first usually much the largest. Nuchals 2-5 (3.6). Midbody scale rows 24-29 (26.1). Lamellae under fourth toe 20-26 (23.0).

Dorsally olive grey or olive brown, unmarked in south, variably marked with black in north (usually with a vertebral, dorsal, and laterodorsal line). White dorsolateral line conspicuous only when margined above with black. Black upper lateral zone enclosing a series of pale vertical bars which may be very narrow or replaced by one or two series of dots; extending as a black stripe forward through orbit to tip of snout and back to about middle of tail. Narrow black lower lateral zone indented or spotted with white. Limbs boldly streaked with black.

Geographic variation. In the far southwest of its range, *i.e.* north to the Darling Range and Merredin, *schomburgkii* is completely unmarked dorsally. In the west there is a 75-mile gap between our southernmost striped-back specimen (New Norcia) and our northernmost plain-back specimen (Bartons Mill). In the east there seems to be a gradual change from plain-back to striped-back; for example, two or four specimens from Holt Rock show a trace of the vertebral stripe, and in our single specimen from Salmon Gums this stripe is still more strongly developed.

I treat *schomburgkii* binomially because I now regard *pallescens* of the Northern Territory as a full species.

Material. South-West Division: 19 mi. E of Kalbarri (33539, 33553); 12 mi. N of Galena (33621-2); Caron (MCZ 33273); 7 mi. N of New

Norcia (25673); Merredin (1267); Bartons Mill (10267); Boyagin Reserve (22516-7); East Pingelly (28315); Lake Magenta Reserve (39933, 39936-7, 40753); Holt Rock (34407, 34507, 36757, 37491); Lake Varley (29049). Eucla Division: Salmon Gums (30792); 12 mi. N of Seemore Downs (25862-3).

Ctenotus brooksi euclae

Ctenotus brooksi euclae Storr, 1971: 14. Eucla, W.A. (W. B. Alexander).

Diagnosis. A member of the *schomburgkii* group with whitish dorsal ground colour and a single presubocular.

Distribution. Coastal sand dunes of Eucla Division, west to Eyre. Extralimital in far western South Australia.

Description and material. See Storr 1971: 14.

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